AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE	

2. AMENDMENT/MODIFICATION NO.	3. EFFECTIVE DATE	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO. (If applicable)
03	08/06/2008	SB 080260	040179

6. ISSUED BY	CODE	7. ADMINISTERED BY (If other than Item 6)	CODE
AOC - Procurement Division 2nd & D Streets, SW Room H2-263 WASHINGTON, DC 20515	9901		

8. NAME AND ADDRESS OF CONTRACTOR (No., street, country, state and ZIP Code)	(X)	9A. AMENDMENT OF SOLICITATION NO.
		RFP080066
	X	9B. DATED (SEE ITEM 11) 07/25/2008
		10A. MODIFICATION OF CONTRACT/ORDER NO.
		10B. DATED (SEE ITEM 11)

CODE	FACILITY CODE

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

[X] The above numbered solicitation is amended as set forth in item 14. The hour and date specified for receipt of Offers [ ] is extended, [X] is not extended,

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods: (a) By completing items 8 and 15, and returning __1__copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment your desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required)

13. THIS ITEM ONLY APPLIES TO MODIFICATION OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

CHECK ONE	
	A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.
	B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
	C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:
	D. OTHER (Specify type of modification and authority)

E. IMPORTANT: Contractor [ ] is not, [ ] is required to sign this document and return _____ copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitaiton/contract subject matter where feasible.)

SEE ATTACHED PAGES - THE DUE DATE AND TIME FOR RECEIPT OF PROPOSALS REMAINS 26 AUG 08, 1:00 P.M.

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER (Type or print)		16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) Frederick Witcher, Jr.	
15B. CONTRACTOR/OFFEROR (Signature of person authorized to sign)	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA By (Signature of Contracting Officer)	16C. DATE SIGNED

Summary Info Continuation Page

B1 ADDITIONAL INFORMATION

1. Remove and Replace the following as indicated:

a. Remove Section 01000, pages 01000-1 thru 01000-5 and Replace with revised pages 01000-1 thru 01000-5

b. Remove Section 02240, page 02240-1 and Replace with revised page 02240-1

c. Remove Section 02261, page 02261-1 and Replace with revised page 02261-1

2. The following drawings are added (copies mailed upon request to the Contracting Officer):

a. C700A - "Limits of Construction"

b. M103 - "Mechanical Steam Piping Demolition Plan"

c. M104 - "Mechanical Steam Piping Plan & Sections"

d. SKS-1 - "Roof Framing Plan"

e. SK-C701 - "Project Laydown Area Location"

3. The following specification sections are added:

a. 01 0000 - General Requirements, Additional Work

b. 23 0500 - Common Work Results for HVAC

c. 23 0529 - Hangers and Supports for HVAC Piping and Equipment

d. 23 0553 - Identification for HVAC Piping and Equipment

e. 23 0700 - HVAC Insulation

f. 23 2213 - Steam and Condensate Heating Piping

4. The following clause is added:

Option for Increased Quantity -- Separately Priced Line Item (Mar 1989)

The Government may require the delivery of the numbered line item, identified in the Schedule as an option item, in the quantity and at the price stated in the Schedule. The Contracting Officer may exercise the option by written notice to the Contractor at anytime up to December 30, 2008. Delivery of added items shall continue at the same rate that like items are called for under the contract, unless the parties otherwise agree.

(End of Clause)

5. If Option 1 is exercised the contract completion date will remain 30 Nov 09. The Government will determine the best value proposal by adding the Base Bid to Option #1.

6. The pre-bid/site visit attendees sign-in sheet is attached.

7. A revised bid schedule is attached.

BASE

Number	Commodity Name	Quantity	Unit of Issue	Unit Price ($)	Total Cost ($, Inc. disc)
1	EMERGENCY GENERATOR SYSTEM, RSOB, PROJECT 040179, GENERATOR #1 ONLY	Total : 1.00	EA	$	$
	Description: Includes all labor, material, equipment and incidentals for the Emergency Generator System, Russell Senate Office Building (RSOB), Washington, D.C., as defined in the General Conditions, Supplementary Conditions, Representations and Certifications, Solicitation Conditions, all specifications and drawings, attachments, etc.				

Lump-Sum Price for Base $

OPTION 1

Number	Commodity Name	Quantity	Unit of Issue	Unit Price ($)	Total Cost ($, Inc. disc)
2	OPTION #1 - EMERGENCY GENERATOR SYSTEM, RSOB, PROJECT 040179, GENERATOR #2 ONLY	Total : 1.00	EA	$	$
	Description: Includes all labor, material, equipment and incidentals for the Emergency Generator System, Russell Senate Office Building (RSOB), Washington, D.C., as defined in the General Conditions, Supplementary Conditions, Representations and Certifications, Solicitation Conditions, all specifications and drawings, attachments, etc. Includes 1000KW generator with 1600A Switch and all HVAC system & associated devices attached to Generator #2 (sound attenuator, louvers, muffler system/generator exhaust pipes, motorized dampers) shown in drawing M301 Section B/M102/M103. .				

Lump-Sum Price for Option 1 $

Lump-Sum Price for All Options $

Lump-Sum Price for Base and All Options $

SECTION 01000 - GENERAL REQUIREMENTS

PART 1 - GENERAL

1.1 DESCRIPTION OF REQUIREMENTS

A. **General Requirements**: The provisions or requirements of Division-1 apply to entire work of Contract and, where so indicated, to other elements which are included in project, and include, but are not limited to the following:

1. Summary of the Work.
2. Project Coordination.
3. Definitions and Standards.
4. Schedules and Reports.
5. Submittals.
6. Temporary Facilities and Controls.
7. Products.
8. Project Closeout.

1.2 SUMMARY OF THE WORK

A. **Project/Work Identification**:

1. General: Project name is Russell Senate Office Building, Emergency Generator System, Project Site is located on Delaware Avenue, between Constitution Avenue and "C" Streets, N.E., Washington, D.C., as shown on Contract Documents prepared by the Architect of the Capitol (AOC). Drawings and specifications are dated **December 12, 2007**.
2. Summary by Reference: Work of the Contract can be summarized by references to the SCHEDULE, GENERAL CONDITIONS, SUPPLEMENTARY CONDITIONS, Official Procedure for Making Changes in Contracts, Specification Sections, Drawings, Amendments and Modifications to the contract documents issued subsequent to the initial printing of this Project Manual and including, but not necessarily limited to, printed material referenced by any of these.
3. Abbreviated Written Summary: Briefly and without force and effect upon the contract documents, the work of the Contract can be summarized as follows:

    a. The work includes the construction of an underground vault with a connector to the Russell Senate Office Building, Switchgear Room B. This work includes, but is not limited to, all lighting, sprinkler systems, fire alarm systems, plumbing and ventilation necessary for the function of the vault and connector. The vault requires a complete exterior waterproofing system.
    b. The work includes installing two 1250 kVA Emergency Generators and construction provisions for a third generator. Just inside the building, new bus duct will connect to bus duct provided under another contract. Work also includes the generator paralleling switchgear, load bank switch and all appropriate conduits, wiring and other equipment for a complete and functioning emergency generator system.
    c. Excessive noise during the operation of the generators is a concern and the project includes the construction of appropriate sound attenuation. After completion of the work, the Contractor shall test the sound levels at the building's windows and at the sidewalk on the park side of Delaware Avenue and assure 50 dB construction guaranteed.

d. This work also includes demolition as well as removal, storage and re-installation of an existing stone balustrade fence.
e. The work includes removal of an existing moat base and wall and building a new moat base and wall.
f. All excavation necessary for vault construction and existing underground utilities relocation is part of this work. The work includes a new underground fuel oil tank, piping and all appropriate monitoring equipment.
g. Finished grading and landscaping are part of this work. .

4. Use of the Contract Documents: The Contract Documents are comprised of the Drawings (produced by several disciplines), the Specifications, the Amendments, the Contract, approved Changes and other directives. These documents are not to be used separately for bid or construction as they represent the entirety of the project. The Contractor is responsible for insuring that the documents are used together.
5. Phasing Plan: No Phasing Plan is included in the Contract Documents. The Contractor is expected to complete all work sequentially to provide the minimum disruption of parking and normal building operations in the area. The Contractor will provide his own plan for approval by the Architect showing proposed sequencing of the work and coordination with Government parking requirements.

B. **Contractor Use of Premises**:

1. Contractor Use of the Existing Building: During the construction period the site and the building will be occupied by Members of Congress, other Government employees and the general public. Maintain the existing building in a safe and weather-tight condition throughout the construction period. Repair damage caused by construction operations. Take all precautions necessary to protect the building and its occupants during the construction period. Cooperate fully with the Architect or his representative during construction operations to minimize conflicts and to facilitate Government usage.

   a. Clear Passage: Keep public areas such as hallways, stairs, elevator lobbies and toilet rooms free from accumulation of waste material, rubbish or construction debris. Where debris, tools, materials, etc. may fall onto, or into the path of pedestrians, Contractor shall provide protection in accordance with applicable safety regulations.

   b. Smoking or open fires will not be permitted within the building enclosure or on the premises.

   c. Standard Working Hours: The standard working hours of operation for the Russell Senate Office Building are as follows. Work may be performed during these hours; any off-hours work shall be coordinated with the Architect and the Senate Superintendent: (Refer to Section 1.7.G.5 about noise control during standard working hours)

      1) Monday through Friday: 8am to 6pm (Noise Restrictions apply).
      2) **Saturday, Sunday: Hours are unlimited, however a request for work must be submitted to the Senate Superintendent's office at least 72 hours in advance of the proposed off-hours work.**
      3) **In general, and to the extent possible, the Contractor shall perform construction activities during the standard construction hours.**

4. **The following types of work shall not be performed during standard occupied hours of operation, but to the extent possible, the Contractor shall perform these activities during the standard construction hours.**

   a. **Any work requiring the shutdown of operating HVAC, electrical, plumbing, or fire protection systems and/or equipment.**
   b. **Any work requiring the shutdown of building entrances or interior corridors.**
   c. **Any work that will produce excessive noise, dust, vibration or odor.**
   d. **Any work requiring obstruction of public roadways or building access.**

5. **Any work that must be performed during non-standard construction working hours shall be fully coordinated with and approved by the Senate Office Buildings Superintendent's Office prior to the start of work. A written request shall be submitted to the Senate Superintendant's Office at least 72 hours in advance of the proposed off-hours work**.

2. Limitations on Use of the Site: Limitations on site usage as well as specific requirements that impact site utilization are indicated on the Drawings and by other Contract Documents. Portions of the site beyond areas on which work is indicated are not to be disturbed. In addition to these limitations and requirements, administer allocation of available space among entities needing both access and space so as to produce the best overall efficiency in performance of the total work of the project. Schedule deliveries so as to minimize space and time requirements for storage of materials and equipment on site.

   a. Unless designated for sole Contractor use, keep existing driveways and entrances serving the premises clear and available to the Government and its employees at all times. Do not permit trucks of any kind to use existing sidewalks without prior authorization of the Architect.
   b. Maintain driveways between and around combustible material storage piles at least 15' wide and free of accumulation of rubbish, equipment and materials. Maintain access for fire fighting equipment.
   c. Do not unreasonably encumber the site with materials or equipment. Confine stockpiling of materials and location of storage sheds to the areas indicated. If additional storage is necessary, obtain and pay for such storage off-site.
   d. Provide 24hr/7day access to the building by emergency vehicles and firefighting equipment.

3. Construction Parking Control: Parking space for personal vehicles is not available on the site. Obtain approval of Architect for parking of construction motor vehicles or other equipment on the site.

C. **Government Occupancy**: The Government reserves the right to place and install equipment as necessary in completed areas of the building and to occupy such areas prior to final acceptance, provided that such occupancy does not substantially interfere with completion of the work. Such placing of equipment and partial occupancy shall not constitute acceptance of the work or any part of the work.

D. **Protection of Government Property**: The Contractor is expected to take all reasonable precautions to protect U.S. Government Property. In the event of damage to or theft of Government Property, the Contractor will be held fully responsible for his own personnel, his subcontractor's personnel and their actions.

E. **Blasting**: The use of any kind or type of explosive in the performance of the work is prohibited, except the use of construction tools actuated by or employing powder-actuated charges which shall be permitted, provided that the tool is of the kind and design ordinarily used for such construction and that the Architect has authorized its use after determining that its use will not endanger human life or safety.

F. **Mechanical/Electrical Requirements of General Work**: Except as otherwise indicated, comply with applicable provisions of The National Electrical Code (NEC), National Electrical Safety Code (NESC, ANSI C2) and standards by National Electrical Manufacturer's Association (NEMA) for electrical components of general work. Where applicable, provide products listed and labeled by nationally recognized independent testing and labeling organizations. Mechanical systems and equipment and the components thereof, will be arranged and installed to provide ready accessibility of AOC employees, post-construction and ease of lock/tag application during lockout/tagout procedures.

1.3 PROJECT COORDINATION

A. **Coordination and Meetings**: Prepare a written memorandum on required coordination activities. Include such items as required notices, reports and attendance at meetings. Distribute this memorandum to each entity performing work at the project site. Prepare similar memorandum for separate contractors where interfacing of their work is required.

1. Continuously coordinate the work of subcontractors to ensure proper processing and progress of the work. Require each subcontractor to examine work of other trades and all sections of specifications to assure satisfactory installation of, and connection between, his work and work of other trades.

    a. Provide other parties, to the extent their work is affected by this work, all information necessary for the proper execution of their work. Arrange and conduct work so that other parties may complete their work at the site according to schedule. All work under this contract shall be carefully coordinated with work under other such contracts.

2. The Contractor shall maintain a complete set of Contract Documents on the site during the execution of this contract. All Drawings and Specifications shall be posted with the latest information and Changes.

B. **Surveys and Records/Reports**: Working from lines and levels established by the property survey, establish and maintain bench marks and other dependable markers. Establish bench marks and markers to set lines and levels for work at each story of construction and elsewhere as needed to properly locate each element of the project. Calculate and measure required dimensions as shown within recognized tolerances. Drawings shall not be scaled to determine dimensions. Advise entities performing work of marked lines and levels provided for their use. Advise Architect promptly upon detection of deviations that exceed indicated tolerances.

C. **General Installation Provisions**:

1. Pre-Installation Meetings: Hold a pre-installation meeting at the project site well before installation of each unit of work which requires coordination with other work. Installer and representatives of the manufacturers and fabricators who are involved in or affected by that unit of work, and with its coordination or integration with other work that has preceded or will follow, shall attend this meeting. Advise Architect of scheduled meeting dates.
2. Installer's Inspection of Conditions: Require the Installer of each major unit of work to inspect the substrate to receive work and conditions under which the work is to be performed. The Installer shall report all unsatisfactory conditions in writing to the Contractor. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.
3. Manufacturer's Instructions: Where installations include manufactured products, comply with the manufacturer's applicable instructions and recommendations for installation, to the extent that these instructions and recommendations are more explicit or more stringent than requirements indicated in the Contract Documents.
4. Mounting Heights: Where mounting heights are not indicated, mount individual units of work at industry recognized standard mounting heights for the particular application indicated. Refer questionable mounting height choices to the Architect for final decision.

a. Mount units of work required to be accessible to handicapped people at heights prescribed by the Uniform Federal Accessibility Standards as referenced by the Americans with Disabilities Act (ADA) (Fed. Reg./Vol. 56, No. 144/Part 36).

D. **Cleaning and Protection**: During handling and installation of work at the project site, clean and protect work in progress and adjoining work on the basis of continuous maintenance. Apply protective covering on installed work where it is required to ensure freedom from damage or deterioration at time of completion.

1. Clean and perform maintenance on installed work as frequently as necessary through remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
2. Limiting Exposures of Work: To the extent possible through reasonable control and protection methods, supervise performance of the work in such a manner and by such means which will ensure that none of the work, whether completed or in progress, will be subjected to harmful, dangerous, damaging or otherwise deleterious exposure during the construction period.

   a. Protect against possible damage all sills, jambs and soffits of permanent openings used as passageways or through which materials are handled. Protect exposed corners, spandrels, projecting features and similar permanent work subject to damage. Cover and protect all prefinished work from damage by mortar, plaster, gypsum drywall compounds, paint, and other construction materials and operations. Use wheelbarrows equipped with rubber tires over permanently exposed floors and paving. Provide special protection for works of art, as prescribed in the Contract Documents.

3. Load all trucks leaving the site with earthen materials or loose debris in a manner that will prevent dropping of materials on streets. Fasten suitable tarpaulins over the load before they enter surrounding paved streets. Trucks bringing earthen materials over paved streets to the site shall be similarly covered.
4. Clean sidewalks and streets adjacent to site daily or more often as necessary, of debris spillage or mud/dirt tracked from loading and trucking involved in construction operations. Maintain suitable truck wheel washing installation and crew to prevent any mud from being carried onto adjacent paved streets. Conform to local regulations regarding load limits.

E. **Cutting and Patching**: Where the Contractor must cut, patch, alter, add to, repair or refinish existing construction and finishes which are not to be removed, he shall leave such construction and finishes complete and in satisfactory condition. Cutting, patching, and the like shall be neatly and carefully performed, and new materials and methods shall match existing corresponding work unless otherwise indicated. Exposed patches and repairs shall be as inconspicuous as possible.

1. Construction, finishes, equipment and other items which are damaged or defaced by reason of work performed under this contract shall be restored to the satisfaction of the Architect.

F. **Conservation and Salvage**: It is a requirement for supervision and administration of the work that construction operations be carried out with the maximum possible consideration given to the conservation of energy, water and materials. In addition, maximum consideration shall be given to salvaging materials and equipment involved in performance of the work but not incorporated therein. Refer to other sections for required disposition of salvage materials which are the Government's property.

1. Architect Notification: To allow time for the Architect to observe the construction, provide a minimum of 48 hours notice of excavation work, completion of steel reinforcing,

SECTION 02240 - DEWATERING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. **Drawings** and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. **This Section** includes construction dewatering.

B. **Related Sections include the following**:

1. Division 1 Section "Temporary Facilities and Controls" for temporary utilities and support facilities.
2. Division 2 Section "Excavation Support and Protection."
3. Division 2 Section "Earthwork" for excavating, backfilling, site grading and for site utilities.
4. **Division 2 Section "Underpinning"**.

1.3 PERFORMANCE REQUIREMENTS

A. **Dewatering Performance**: Design, furnish, install, test, operate, monitor, and maintain dewatering system of sufficient scope, size, and capacity to control ground-water flow into excavations and permit construction to proceed on dry, stable subgrades.

1. Maintain dewatering operations to ensure erosion control, stability of excavations and constructed slopes, that excavation does not flood, and that damage to subgrades and permanent structures is prevented.
2. Prevent surface water from entering excavations by grading, dikes, or other means.
3. Accomplish dewatering without damaging existing buildings adjacent to excavation.
4. Remove dewatering system if no longer needed.

1.4 SUBMITTALS

A. **Shop Drawings for Information**: For dewatering system. Show arrangement, locations, and details of wells and well points; locations of headers and discharge lines; and means of discharge and disposal of water.

1. Include layouts of piezometers and flow-measuring devices for monitoring performance of dewatering system.
2. Include a written report outlining control procedures to be adopted if dewatering problems arise.

SECTION 02261 - UNDERPINNING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. **Drawings** and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. **This Section** includes underpinning and integrated shoring systems.

B. **Related Sections include the following**:

1. Division 1 Section "Temporary Facilities and Controls" for temporary utilities and support facilities.
2. Division 2 Section "Dewatering" for dewatering excavations.
3. Division 2 Section "Earthwork" for excavating, backfilling and for existing utilities.
4. Division 2 Section "Excavation Support and Protection."

1.3 PERFORMANCE REQUIREMENTS

A. **Design, furnish**, install, monitor and maintain underpinning system capable of supporting existing construction and of resisting soil and hydrostatic pressure and superimposed and construction loads. The underpinning system shall meet, as a minimum, the requirements set forth in the Contract Drawings.

1. Provide professional engineering services needed to assume engineering responsibility, including preparation of Shop Drawings and a comprehensive engineering analysis by a qualified professional engineer.
2. Install underpinning systems without damaging existing buildings, pavements and other improvements adjacent to excavation.
3. Underpinning system depicted in the Contract Drawings is one possible method of underpinning. Possible underpinning systems include, but are not limited to, pit underpinning and grouted pile underpinning. Lateral bracing may be required for underpinning system including, but not limited to, tiebacks.
4. Lateral design loading diagrams to be used as a minimum design loading for design of the underpinning systems are shown on the Contract Drawings. Determine the appropriate lateral design loads for the specific conditions at the project site for use in designing the underpinning systems.
5. **Excavated areas for the placement of underpinning must be kept dry**.

1.4 SUBMITTALS

SECTION 01 0000 – GENERAL REQUIREMENTS, ADDITIONAL WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 DESCRIPTION OF REQUIREMENTS

A. General Requirements: The provisions or requirements of Division 01 apply to the entire work of this Contract and, where so indicated, to other elements which are included in this project, and include, but are not limited to the following:

1. Summary of Additional Work.
2. Project Coordination.
3. Codes and Standards.

1.3 SUMMARY OF THE ADDITIONAL WORK

A. Project/Work Identification:

1. General: Project name is "Steam Piping Modifications for the Emergency Generator System," Washington, D.C., as shown on Con tract Documents prepared for the Architect of the Capitol (AOC).
2. Background: This piping provides steam to the Underground Senate Garage. The piping system was installed in 2008 and needs to be modified to accommodate installation of the Emergency Generator Vault.

B. Additional Project Scope of Work: Briefly and without force and effect upon the contract documents, the work of this contract is summarized as follows:

1. Excavate around the steam and condensate piping for vault construction. Temporarily support the piping as needed.
2. Isolate and disconnect the steam and condensate piping to be relocated. Salvage and retain selected items for reuse.
3. Demolish and dispose of or recycle sections of two 6" steam and one 3" steam condensate piping runs.
4. Reroute the piping runs through Emergency Generator Vault Areaway #1 as shown on the drawings. Provide custom fabricated pipe supports and reinstall salvaged items. Test piping upon completion.
5. Insulate, jacket and label rerouted piping runs.

C. Additional requirements:

1. This work includes all materials, equipment, labor, supplies and supervision necessary to perform the work outlined above and included in the following documents.
2. The contractor will coordinate the schedule with the Contracting Officer's Technical Representative (COTR).
3. Provide adequately trained and certified personnel working in accordance with the safety and health requirements specified.
4. Set-up temporary facilities and controls, as required.

D. Contractor Responsibilities: The Contractor shall assume full responsibility and liability for compliance with all applicable Federal, State, and local regulations pertaining to the protection of workers, visitors to the site, and persons occupying areas adjacent to the site. The Contractor is responsible for providing medical examinations and maintaining medical records of personnel as required by the applicable Federal, State, and local regulations, and shall hold the government harmless for failure to comply with any applicable safety or health regulation on the part of himself, his employees, or his subcontractors.

E. Protection of Government Property: The Contractor is expected to take all reasonable precautions to protect U.S. Government Property. In the event of damage to or theft of Government Property, the Contractor will be held fully responsible for his own personnel, his subcontractor's personnel and their actions.

1.4 PROJECT COORDINATION:

A. Coordinate this work with the Russell Senate Office Building Emergency Generator System installation.

1.5 CODES AND STANDARDS:

A. General: Comply with governing regulations and the codes and standards imposed upon the work. These requirements include the obtaining of permits, licenses, inspections, releases and similar documentation, as well as payments, statements and similar requirements associated with regulations, codes and standards.

1.6 PHOTOGRAPHS:

A. Provide photographic documentation of the steam piping modifications during both demolition and construction. Photos shall be in accordance with applicable portions of other Division 01 specification sections.

1. Submit photos to the COTR.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01 0000

SECTION 23 0500 - COMMON WORK RESULTS FOR HVAC

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Piping materials and installation instructions common to most piping systems.
2. Mechanical sleeve seals.
3. Sleeves.
4. Grout.
5. HVAC demolition.
6. Equipment installation requirements common to equipment sections.
7. Painting and finishing.
8. Supports and anchorages.

1.3 DEFINITIONS

A. Exposed, Exterior Installations: Exposed to view outdoors or subject to outdoor ambient temperatures and weather conditions. Examples include rooftop locations.

B. The following are industry abbreviations for rubber materials:

1. EPDM: Ethylene-propylene-diene terpolymer rubber.
2. NBR: Acrylonitrile-butadiene rubber.

1.4 QUALITY ASSURANCE

A. Steel Support Welding: Qualify processes and operators according to AWS D1.1, "Structural Welding Code--Steel."

B. Steel Pipe Welding: Qualify processes and operators according to ASME Boiler and Pressure Vessel Code: Section IX, "Welding and Brazing Qualifications."

1. Comply with provisions in ASME B31 Series, "Code for Pressure Piping."
2. Certify that each welder has passed AWS qualification tests for welding processes involved and that certification is current.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver pipes and tubes with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe end damage and to prevent entrance of dirt, debris, and moisture.

PART 2 - PRODUCTS

2.1 PIPE, TUBE, AND FITTINGS

A. Refer to individual Division 23 piping Sections for pipe, tube, and fitting materials and joining methods.

2.2 JOINING MATERIALS

A. Refer to individual Division 23 piping Sections for joining materials.

2.3 MECHANICAL SLEEVE SEALS (REUSE EXISTING)

A. Description: Modular sealing element unit, designed for field assembly, to fill annular space between pipe and sleeve.

1. Sealing Elements: EPDM or NBR interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
2. Pressure Plates: Stainless steel. Include two for each sealing element.
3. Connecting Bolts and Nuts: Stainless steel of length required to secure pressure plates to sealing elements. Include one for each sealing element.

2.4 SLEEVES

A. Steel Pipe: ASTM A 53, Type E, Grade B, Schedule 40, galvanized, plain ends.

2.5 GROUT

A. Description: ASTM C 1107, Grade B, nonshrink and nonmetallic, dry hydraulic-cement grout.

1. Characteristics: Post-hardening, volume-adjusting, nonstaining, noncorrosive, nongaseous, and recommended for interior and exterior applications.
2. Design Mix: 5000-psi, 28-day compressive strength.
3. Packaging: Premixed and factory packaged.

PART 3 - EXECUTION

3.1 HVAC DEMOLITION

A. Disconnect, demolish, and remove HVAC systems, equipment, and components indicated to be removed.

1. Piping to Be Removed: Remove and dispose of or recycle portion of piping to be removed.

B. If pipe, insulation, or equipment to remain is damaged in appearance or is unserviceable, remove damaged or unserviceable portions and replace with new products of equal capacity and quality.

3.2 PIPING SYSTEMS - COMMON REQUIREMENTS

A. Install piping according to the following requirements and Division 23 Sections specifying piping systems.

B. Sleeves are not required for core-drilled holes in poured concrete walls.

C. Install sleeves for pipes passing through concrete and masonry walls.

1. Cut sleeves to length for mounting flush with both surfaces.
2. Seal space outside of sleeve fittings with grout.

D. Aboveground, Exterior-Wall Pipe Penetrations: Seal penetrations using sleeves and sealant using joint sealants appropriate for size, depth, and temperature of piping system. Select sleeve size to allow for minimum 1/2-inch annular clear space between pipe and sleeve for installing sealant.

E. Underground, Exterior-Wall Pipe Penetrations: Core drill holes and seal pipe penetrations using mechanical sleeve seals. Select core drill size to allow for minimum 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.

1. Mechanical Sleeve Seal Installation: Reuse existing mechanical sleeve seal. Position pipe in center of sleeve. Assemble mechanical sleeve seals and install in annular space between pipe and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.3 PIPING JOINT CONSTRUCTION

A. Join pipe and fittings according to the following requirements and Division 23 Sections specifying piping systems.

3.4 PAINTING

A. Damage and Touchup: Repair marred and damaged factory-painted finishes with materials and procedures to match original factory finish.

3.5 ERECTION OF METAL SUPPORTS AND ANCHORAGES

A. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor HVAC materials and equipment.

B. Field Welding: Comply with AWS D1.1.

3.6 GROUTING

A. Clean surfaces that will come into contact with grout.

B. Provide forms as required for placement of grout.

C. Avoid air entrapment during placement of grout.

D. Place grout around anchors.

E. Cure placed grout.

END OF SECTION 23 0500

SECTION 23 0529 - HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following hangers and supports for HVAC system piping and equipment:

1. Steel pipe hangers and supports.
2. Hanger shield inserts.
3. Fastener systems.

1.3 DEFINITIONS

A. MSS: Manufacturers Standardization Society for The Valve and Fittings Industry Inc.

B. Terminology: As defined in MSS SP-90, "Guidelines on Terminology for Pipe Hangers and Supports."

1.4 PERFORMANCE REQUIREMENTS

A. Select supports for multiple pipes capable of supporting combined weight of supported systems, system contents, and test water.

B. Select valve and equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.

1.5 QUALITY ASSURANCE

A. Welding: Qualify procedures and personnel according to the following:

1. AWS D1.1, "Structural Welding Code--Steel."
2. ASME Boiler and Pressure Vessel Code: Section IX.

PART 2 - PRODUCTS

2.1 STEEL PIPE HANGERS AND SUPPORTS

A. Description: Shop- or field-fabricated pipe-support assembly made from structural-steel shapes.

B. Galvanized, Metallic Coatings: Pregalvanized or hot dipped.

2.2 HANGER SHIELD INSERTS

A. Description: Factory fabricated steel pipe protection saddle encased in sheet metal shield. Tack weld shield in place. Shield shall cover entire circumference of pipe.

2.3 FASTENER SYSTEMS

A. Mechanical-Expansion Anchors: Insert-wedge-type stainless steel, for use in hardened portland cement concrete with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

2.4 MISCELLANEOUS MATERIALS

A. Structural Steel: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.

B. Grout: ASTM C 1107, factory-mixed and -packaged, dry, hydraulic-cement, nonshrink and nonmetallic grout; suitable for interior and exterior applications.

1. Properties: Nonstaining, noncorrosive, and nongaseous.
2. Design Mix: 5000-psi, 28-day compressive strength.

PART 3 - EXECUTION

3.1 HANGER AND SUPPORT APPLICATIONS

A. Specific hanger and support requirements are specified in Sections specifying piping systems and equipment.

B. Comply with MSS SP-69 for pipe hanger selections and applications that are not specified on the drawings.

C. Saddles and Shields: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Steel Pipe-Covering Protection Saddles (MSS Type 39): To fill interior voids with insulation that matches adjoining insulation.
2. Protection Shields (MSS Type 40): Of length recommended in writing by manufacturer to prevent crushing insulation.

D. Use mechanical-expansion anchors in concrete construction.

3.2 HANGER AND SUPPORT INSTALLATION

A. Steel Pipe Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Install hangers, supports, clamps, and attachments as required to properly support piping from building structure.

B. Hanger Shield Installation: Install in pipe hanger or shield for insulated piping.

C. Fastener System Installation:

1. Install mechanical-expansion anchors in concrete after concrete is placed and completely cured. Install fasteners according to manufacturer's written instructions.

D. Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers, and other accessories.

E. Support Installation: Fabricate from welded-structural-steel shapes.

F. Install hangers and supports to allow controlled thermal and seismic movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion loops, expansion bends, and similar units.

G. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and so maximum pipe deflections allowed by ASME B31.1 (for power piping) and ASME B31.9 (for building services piping) are not exceeded.

H. Insulated Piping: Comply with the following:

1. Install protection saddles at pipe supports as indicated. Fill interior voids with insulation that matches adjoining insulation.
2. Shield Dimensions for Pipe: Not less than the following:

   a. NPS 1/4 to NPS 3-1/2: 12 inches long and 0.048 inch thick.
   b. NPS 4: 12 inches long and 0.06 inch thick.
   c. NPS 5 and NPS 6: 18 inches long and 0.06 inch thick.

3. Insert Material: Length at least as long as protective shield.

3.3 ADJUSTING

A. Hanger Adjustments: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.

B. Trim excess length of continuous-thread hanger and support rods to 1-1/2 inches.

3.4 PAINTING

A. Touch Up: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.

1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils.

B. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

END OF SECTION 23 0529

SECTION 23 0553 - IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Pipe labels.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples: For color, letter style, and graphic representation required for each identification material and device.

1.4 COORDINATION

A. Coordinate installation of identifying devices with completion of covering where devices are to be applied.

B. Install identifying devices prior to installing sound attenuation panels.

PART 2 - PRODUCTS

2.1 PIPE LABELS

A. General Requirements for Manufactured Pipe Labels: Preprinted, color-coded, with lettering indicating service, and showing flow direction.

B. Pretensioned Pipe Labels: Precoiled, semirigid plastic formed to partially cover circumference of pipe and to attach to pipe with nylon ties if label does not wrap around entire pipe diameter.

C. Self-Adhesive Pipe Labels: Printed plastic with contact-type, permanent-adhesive backing.

D. Pipe Label Contents: Include identification of piping service using same designations or abbreviations as used on Drawings, pipe size, and an arrow indicating flow direction.

1. Flow-Direction Arrows: Integral with piping system service lettering to accommodate both directions, or as separate unit on each pipe label to indicate flow direction.
2. Lettering Size: At least 1-1/2 inches high.

PART 3 - EXECUTION

3.1 PREPARATION

A. Clean piping and equipment surfaces of substances that could impair bond of identification devices, including dirt, oil, grease, release agents, and incompatible primers, paints, and encapsulants.

3.2 PIPE LABEL INSTALLATION

A. Locate pipe labels as follows:

1. Near penetrations through walls, floors, ceilings, and inaccessible enclosures.
2. Spaced at maximum intervals of 25 feet along each run.

B. Pipe Label Color Schedule:

1. Medium-Pressure Steam Piping:

   a. Background Color: Yellow.
   b. Letter Color: Black.

2. Steam Condensate Piping:

   a. Background Color: Yellow.
   b. Letter Color: Black.

END OF SECTION 23 0553

SECTION 23 0700 - HVAC INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes pipe insulation.

1.3 DEFINITIONS

A. Hot Surfaces: Normal operating temperatures of 100 deg F or higher.

B. Thermal resistivity is designated by an R-value that represents the reciprocal of thermal conductivity (K-value). Thermal conductivity is the rate of heat flow through a homogenous material exactly 1-inch thick. Thermal resistivity (R-value) is expressed by the temperature difference in degrees Fahrenheit between the two exposed faces required to cause 1 Btu per hour to flow through 1 square foot at mean temperatures indicated.

C. Thermal Conductivity (K-value): Measure of heat flow through a material at a given temperature difference; conductivity is expressed in units of Btu x inch/h x sq. ft. x deg F.

D. Density: Is expressed in pcf.

1.4 SUBMITTALS

A. Submit product data for all materials in accordance with Division 01 Section, "Submittal Procedures."

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Skilled mechanics who have successfully completed an apprenticeship program.

B. Fire Performance Characteristics: Conform to the following characteristics for insulation including facings, cements, and adhesives, when tested according to ASTM E 84, by UL or other testing or inspecting organization acceptable to the authority having jurisdiction. Label insulation with appropriate markings of testing laboratory.

1. Interior Insulation: Flame-spread rating of 25 or less and a smoke developed rating of 50 or less.

1.6 SEQUENCING AND SCHEDULING

A. Schedule insulation application after testing of piping and duct systems.

PART 2 - PRODUCTS

2.1 CELLULAR GLASS INSULATION

A. Cellular-Glass Insulation: Inorganic, foamed or cellulated glass, annealed, rigid, hermetically sealed cells, incombustible.

1. Preformed Pip Insulation, without Jacket: Comply with ASTM C552, Type II, Class 1.
2. Preformed Pipe Insulation, with Factory-Applied Jacket: Comply with ASTM C552, Type II, Class 2.
3. Factory-fabricated shapes according to ASTM C450 and ASTM C585.

2.2 ADHESIVES

A. Lagging Adhesive: MIL-A-3316C, non-flammable adhesive in the following Classes and Grades:

2.3 JACKETS

A. General: ASTM C 921, Type 1, except as otherwise indicated.

B. Stainless Steel Jacket: Stainless steel roll stock, ready for shop or field cutting and forming to indicated sizes. Comply with ASTM A167 or ATM A 240 / A 240M.

1. Finish and Thickness: Type 304 or 316, smooth 2E finish, 0.016 inch thick.
2. Moisture Barrier: 3-mil-thick, heat-bonded polyethylene and kraft paper.
3. Elbows: Preformed, 45- and 90-degree, short- and long-radius elbows; same material, finish, and thickness as jacket.

2.4 ACCESSORIES AND ATTACHMENTS

A. Bands: 3/4-inch wide, in one of the following materials compatible with jacket:

1. Stainless Steel: Type 304, 0.020-inch thick.

B. Wire: 16 gage, soft-annealed stainless steel, or 16 gage, soft-annealed galvanized steel.

PART 3 - EXECUTION

3.1 PREPARATION

A. Surface Preparation: Clean, dry, and remove foreign materials such as rust, scale, and dirt.

3.2 INSTALLATION, GENERAL

A. Refer to schedules at the end of this Section for materials, forms, jackets, and thicknesses required for each mechanical system.

B. Select accessories compatible with materials suitable for the service. Select accessories that do not corrode, soften, or otherwise attack the insulation or jacket in either the wet or dry state.

C. Apply insulation material, accessories, and finishes according to the manufacturer's printed instructions.

D. Install insulation with smooth, straight, and even surfaces.

E. Seal penetrations for hangers, supports, anchors, and other projections in insulation requiring a vapor barrier.

F. Seal ends with lagging adhesive.

G. Apply adhesives and coatings at manufacturer's recommended coverage-per-gallon rate.

H. Keep insulation materials dry during application and finishing.

3.3 PIPE INSULATION INSTALLATION, GENERAL

A. Tightly butt longitudinal seams and end joints. Bond with adhesive.

B. Apply insulation continuously over fittings, valves, and specialties, except as otherwise indicated.

C. Apply insulation with a minimum number of joints.

D. Walls and Partitions Penetrations: Apply insulation continuously through walls and partitions, except as noted. Apply a stainless steel jacket with factory-applied moisture barrier over insulation. Extend 2 inches from both surfaces of wall or partition. Secure jacket with metal bands at both ends. Seal ends of jacket with vapor barrier coating. Seal around penetration with silicone sealant.

E. Hangers and Anchors: Apply insulation continuously through hangers and around anchor attachments. Install saddles, shields, and inserts as specified in Division 23 Section "Hangers and Supports."

1. Inserts and Shields: Cover hanger inserts and shields with jacket material matching adjacent pipe insulation.

3.4 CELLULAR GLASS INSULATION APPLICATION

A. Apply insulation to straight pipes and tubes as follows:

1. Secure each layer of insulation to pipe with tape or bands without deforming insulation materials.
2. Where vapor retarders are indicated, seal longitudinal seams and end joints with vapor-retarder mastic.

B. Apply insulation to fittings and elbows as follows:

1. Apply premolded insulation sections of the same material as straight segments of pipe insulation when available. Secure according to manufacturer's written instructions.
2. When premolded sections of insulation are not available, apply mitered sections of cellular-glass insulation. Secure insulation materials with tape or bands.
3. Cover fittings with pre-manufactured stainless steel fitting covers.

3.5 APPLICATIONS

A. General: Materials and thicknesses are specified in schedules at the end of this Section.

B. Piping Systems: Unless otherwise indicated, insulate the following piping systems:

1. Steam and steam condensate piping to 150 psig.

3.6 FIELD-APPLIED JACKET APPLICATION

A. On cellular glass pipe insulation, provide laminated bituminous jacket beneath metal jacket.

B. Apply metal jacket where indicated, with 2-inch overlap at longitudinal seams and end joints. Overlap longitudinal seams arranged to shed water. Seal end joints with weatherproof sealant recommended by insulation manufacturer. Secure jacket with stainless-steel bands 12 inches o.c. and at end joints.

C. Install premanufactured stainless steel fitting covers on insulation which has the field applied stainless steel jacketing.

D. Install the PVC fitting covers, on interior fiberglass pipe insulation, with overlap at longitudinal joints and seal with adhesive.

3.7 PIPE INSULATION SCHEDULES

A. General: Abbreviations used in the following schedules include:

1. Pipe Sizes: NPS - Nominal Pipe Size.

EXTERIOR MEDIUM PRESSURE STEAM (250 TO 350 DEG F) EXPOSED AND CONCEALED

Pipe Sizes (NPS)	Materials	Thickness In Inches	Vapor Barrier Required	Field-Applied Jacket
5 to 10	Cellular Glass	3	Yes	Stainless Steel

EXTERIOR STEAM CONDENSATE (200 TO 250 DEG F) EXPOSED AND CONCEALED

Pipe Sizes (NPS)	Materials	Thickness In Inches	Vapor Barrier Required	Field-Applied Jacket
1-1/2 to 4	Cellular Glass	2	Yes	Stainless Steel

END OF SECTION 23 0700

SECTION 23 2213 - STEAM AND CONDENSATE HEATING PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following for medium pressure steam and steam condensate piping:

1. Pipe and fittings.

1.3 PERFORMANCE REQUIREMENTS

A. Components and installation shall be capable of withstanding the following minimum working pressures and temperatures:

1. Medium Pressure Steam Piping: 150 psig.
2. Condensate Piping: 100 psig at 250 deg F.

1.4 SUBMITTALS

A. Qualification Data: For Installer.

B. Welding certificates.

C. Field quality-control test reports.

1.5 QUALITY ASSURANCE

A. Steel Support Welding: Qualify processes and operators according to AWS D1.1, "Structural Welding Code - Steel."

B. Pipe Welding: Qualify processes and operators according to the following:

1. Comply with provisions in ASME B31 Series, "Code for Pressure Piping."
2. Certify that each welder has passed AWS qualification tests for welding processes involved and that certification is current.

C. ASME Compliance: Comply with ASME B31.1, "Power Piping" and ASME B31.9, "Building Services Piping" for materials, products, and installation.

PART 2 - PRODUCTS

2.1 STEEL PIPE AND FITTINGS

A. Steel Pipe: ASTM A 53/A 53M, black steel, plain ends, Type, Grade, and Schedule as indicated in Part 3 piping applications articles.

B. Wrought-Steel Fittings: ASTM A 234/A 234M, wall thickness to match adjoining pipe.

C. Steel Pipe Nipples: ASTM A 733, made of ASTM A 53/A 53M, black steel of same Type, Grade, and Schedule as pipe in which installed.

2.2 JOINING MATERIALS

A. Welding Filler Metals: Comply with AWS D10.12 for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.

B. Welding Materials: Comply with Section II, Part C, of ASME Boiler and Pressure Vessel Code for welding materials appropriate for wall thickness and for chemical analysis of pipe being welded.

PART 3 - EXECUTION

3.1 MEDIUM PRESSURE STEAM PIPING APPLICATIONS

A. Steam Piping, NPS 2-1/2 through NPS 12: Schedule 40, Type E, Grade B, steel pipe; Class 300 wrought-steel fittings, flanges, and flange fittings; and welded and flanged joints.

B. Condensate piping above grade, NPS 2-1/2 and Larger: Schedule 80, Type E, Grade B, steel pipe; Class 150 wrought-steel fittings, flanges, and flange fittings; and welded and flanged joints.

3.2 PIPING INSTALLATION

A. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.

B. Install piping indicated to be exposed and piping in equipment and service areas at right angles or parallel to vault walls. Diagonal runs are prohibited unless specifically indicated otherwise.

C. Install piping free of sags and bends.

D. Install fittings for changes in direction and branch connections.

E. Install piping to allow application of insulation.

F. Select system components with pressure rating equal to or greater than system operating pressure.

G. Install groups of pipes parallel to each other, spaced to permit applying insulation and servicing of valves.

H. Install steam supply piping at a minimum uniform grade of 0.2 percent downward in direction of steam flow.

I. Install pumped condensate return piping at a minimum uniform grade of 0.2 percent.

J. Identify piping as specified in Division 23 Section "Identification for HVAC Piping and Equipment."

3.3 HANGERS AND SUPPORTS

A. Install hangers and supports according to Division 23 Section "Hangers and Supports for HVAC Piping and Equipment." Comply with requirements below for maximum spacing.

B. Install the following pipe attachments:

1. Adjustable steel clevis hangers for individual horizontal piping less than 20 feet long.
2. Adjustable roller hangers and spring hangers for individual horizontal piping 20 feet or longer.
3. Pipe Roller: MSS SP-58, Type 44 for multiple horizontal piping 20 feet or longer, supported on a trapeze.

C. Install hangers with the following maximum spacing and minimum rod sizes:

1. NPS 3: Maximum span, 15 feet; minimum rod size, 3/8 inch.
2. NPS 6: Maximum span, 21 feet; minimum rod size, 1/2 inch.

3.4 PIPE JOINT CONSTRUCTION

A. Join pipe and fittings according to the following requirements and Division 23 Sections specifying piping systems.

B. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.

C. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.

D. Welded Joints: Construct joints according to AWS D10.12, using qualified processes and welding operators according to Part 1 "Quality Assurance" Article.

3.5 FIELD QUALITY CONTROL

A. Prepare steam and condensate piping according to ASME B31.1, "Power Piping" and ASME B31.9, "Building Services Piping," and as follows:

1. Leave joints, including welds, uninsulated and exposed for examination during test.
2. Flush system with clean water. Clean strainers.
3. Isolate equipment from piping. If a valve is used to isolate equipment, its closure shall be capable of sealing against test pressure without damage to valve.

B. Perform the following tests on steam and condensate piping:

1. Use ambient temperature water as a testing medium unless there is risk of damage due to freezing. Another liquid that is safe for workers and compatible with piping may be used.
2. Subject piping system to hydrostatic test pressure that is not less than 1.5 times the working pressure. Test pressure shall not exceed maximum pressure for any vessel, pump, valve, or other component in system under test. Verify that stress due to pressure at bottom of vertical runs does not exceed 90 percent of specified minimum yield strength.
3. After hydrostatic test pressure has been applied for at least 10 minutes, examine piping, joints, and connections for leakage. Eliminate leaks by tightening, repairing, or replacing components, and repeat hydrostatic test until there are no leaks.

C. Prepare written report of testing.

END OF SECTION 23 2213

RFP080066, Emergency Generator System, Russell Senate Office Building, Washington DC

SITE VISIT LIST OF ATTENDEES

Monday, August 4, 2008
8:30 a.m.

PLEASE PRINT PLEASE PRINT PLEASE PRINT

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